Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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InfiniiVision 2000 X-Series Oscilloscopes

Data Sheet

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Oscilloscopes redefined: Breakthrough technology delivers more scope for the same budget

Agilent Technologies

Oscilloscopes redefined: Breakthrough technology delivers more scope for the same budget

Breakthrough technology for budget conscious customers

Agilent Technologies is the fastest growing scope vendor in the market for good reason: we deploy our investments in technology to solve your measurement problems. This commitment to superior technology brings you the InfiniiVision X-Series oscilloscopes – engineered to deliver value, functionality and flexibility at prices that fit into your existing budgets. Whether you are looking for a basic entry-level oscilloscope or a more sophisticated model to get your job done, you want the most you can get for your money. The full line of InfiniiVision X-Series oscilloscopes – 26 models – ensure that you get exactly what you need today with room to grow in the future.

Overview of the Agilent InfiniiVision X-Series oscilloscopes

	InfiniiVision 2000 X-Series	InfiniiVision 3000 X-Series
Analog channels	2 and 4 analog channels	
Digital timing channels	8 on MSO models or with DSOX2MSO upgrade	16 on MSO models or with DSOX3MSO upgrade
Bandwidth (upgradable)	70, 100, 200 MHz	100, 200, 350, 500 MHz
Sample rate	1 GSa/s per channel 2 GSa/s half channel interleaved mode	2 GSa/s per channel 4 GSa/s half channel interleaved mode
Memory depth	100 kpts	2 Mpts standard, 4 Mpts optional (Option DSOX3MemUp)
Waveform update rate	50,000 waveforms per second	1,000,000 waveforms per second
WaveGen built-in 20 MHz function generator	Yes (Option DSOX2WAVEGEN)	Yes (Option DSOX3WAVEGEN)
Search and navigate	No	Yes
Serial protocol analysis	No	Yes (multiple options)
Segmented memory	Yes (Option DSOX2SGM)	Yes (Option DSOX3SGM)
Mask limit testing	Yes (Option DSOX2MASK)	Yes (Option DSOX3MASK)
AutoProbe interface	No	Yes

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Need more memory or bandwidth?

See the InfiniiVision 7000B Series oscilloscopes

- 2 or 4 analog channels plus an optional 16 digital channels
- 100 MHz - 1 GHz bandwidth
- 8 Mpts memory (standard)
- Search and navigate capability
- Serial protocol analysis application available
- FPGA dynamic probe application available

See **www.agilent.com/find/7000** for more details

Oscilloscopes redefined: Breakthrough technology delivers more scope for the same budget

More scope

The InfiniiVision 2000 X-Series offers entry-level price points to fit your budget with superior performance and optional capabilities that are not available in any other oscilloscope in its class. Agilent's breakthrough technology delivers more scope for the same budget.

With more scope, you can:

- **See more** of your signal more of the time with the largest screen in its class, the deepest memory and the fastest waveform update rates
- **Do more** with the power of 3 instruments in 1: oscilloscope, logic timing analyzer and WaveGen built-in function generator (optional)
- **Get more** investment protection with the industry's only fully upgradable scope, including bandwidth

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Oscilloscopes redefined: Breakthrough technology delivers more scope for the same budget

See more of your signal, more of the time

Largest display

Engineering for the best signal visibility starts with the largest display. Our 8.5-inch WVGA display offers twice the viewing area with five times the resolution (WVGA 800x480 versus QVGA 320x240).

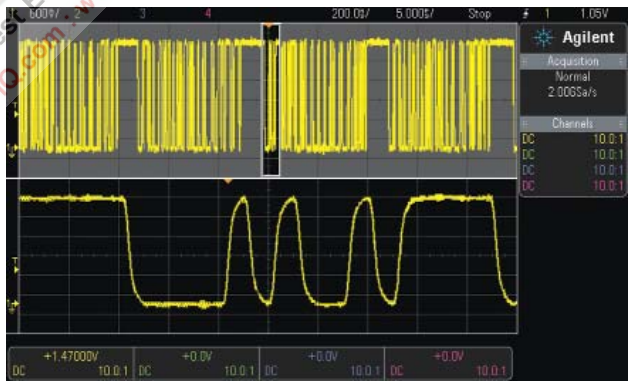
Fastest update rate

With Agilent-designed *MegaZoom* IV custom ASIC technology, the InfiniiVision 2000 X-Series family delivers up to 50,000 waveforms per second. With this speed you can see signal detail and infrequent anomalies more of the time.

Notice that the Agilent 2000 X-Series allows you to see more of your signals, and captures the infrequent glitch that you are unable to see on other oscilloscopes in this class.

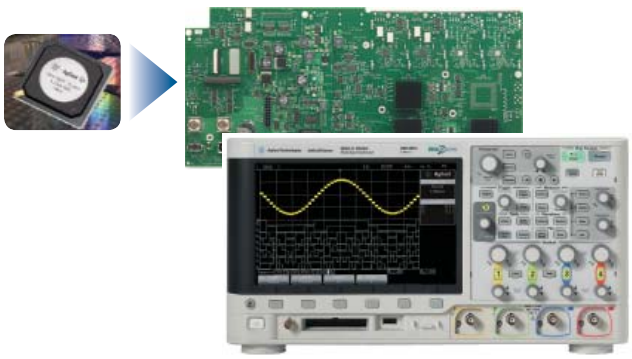
Deeper memory for longer time capture

With up to 100 kpts of memory you get 40X more than other scopes in this class, enabling you to capture long, non-repeating signals while maintaining a high sample rate, then quickly zoom in on areas of interest. Deep memory lets the scope maintain a high sample rate over longer time spans.



How does Agilent do that?

Agilent-designed *MegaZoom IV* custom ASIC technology combines the capabilities of an oscilloscope, logic analyzer, and WaveGen built-in function generator in a compact form factor at an affordable price. 4th generation *MegaZoom* technology enables the industry's fastest waveform update rate with responsive deep memory acquisitions.



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Oscilloscopes redefined: Breakthrough technology delivers more scope for the same budget

Do more with the power of 3 instruments in 1

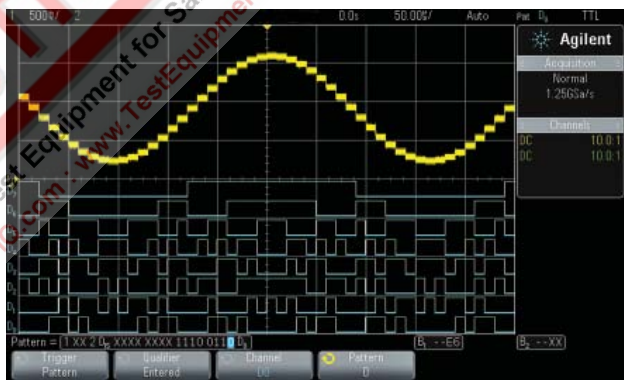
Best-in-class oscilloscope

The InfiniiVision 2000 X-Series features the deepest memory in its class with 100 kpts of Agilent's patented *MegaZoom* IV technology that is always enabled and always responsive providing the industry's fastest update rate at up to 50,000 waveforms per second, with no compromise if you turn on measurements or add digital channels.

In addition, the 2000 X-Series offers 23 automated measurements such as voltage, time, and frequency as well as four waveform math functions including FFT. All of this at a comparable price to the Tektronix TDS2000C oscilloscope.

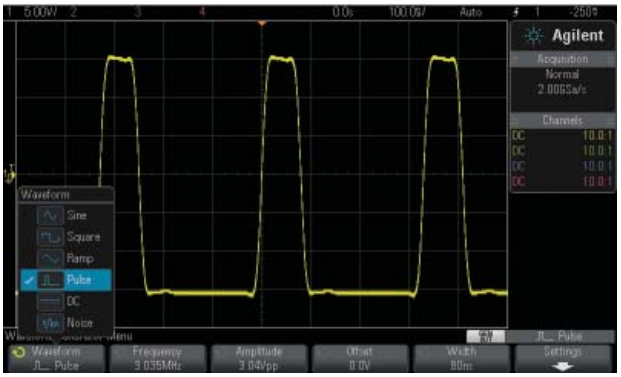
Industry's first economy-class mixed signal oscilloscope (MSO)

The 2000 X-Series is the first instrument in its class to offer an integrated logic timing analyzer. Up until now oscilloscopes in this class have only come with 2 or 4 analog channel options. However, digital content is everywhere in today's designs and traditional 2 and 4 channel oscilloscopes do not always provide enough channels for the job at hand. With an additional 8 integrated digital timing channels, you now have up to 12 channels of time-correlated triggering, acquisition and viewing on the same instrument. Buy a 2 or 4 channel DSO and at any time, upgrade it yourself to a MSO with a license to turn on those integrated 8 digital timing channels.



Industry-exclusive WaveGen built-in function generator

An industry first, the 2000 X-Series offers an integrated 20 MHz function generator. Ideal for educational or design labs where bench space and budget are at a premium, the integrated function generator provides stimulus output of sine, square, ramp, pulse, DC and noise waveforms to your device under test. No need to buy a separate function generator when you can get one integrated in your new oscilloscope. Turn on WaveGen at any time by ordering the DSOX2WaveGen option and install the license yourself.



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Oscilloscopes redefined: Breakthrough technology delivers more scope for the same budget

Get more investment protection with the industry's only fully upgradable oscilloscope

Upgradability:

Project needs change, but traditional oscilloscopes are fixed – you get what you pay for at the time of purchase. With the 2000 X-Series, your investment is protected. If you need more bandwidth (up to 200 MHz), digital channels, WaveGen or measurement applications in the future, you can easily add them all after the fact.

Add at the time of your purchase or upgrade later:

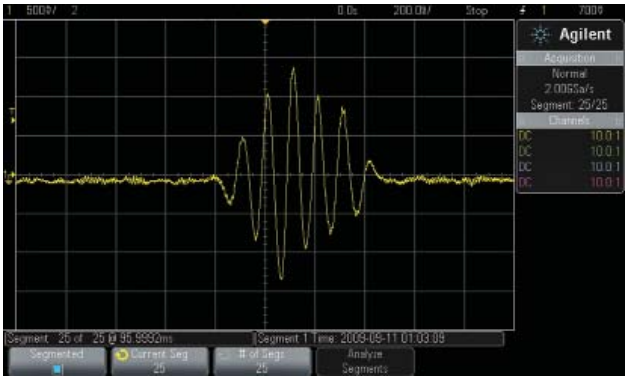
- Bandwidth
- Digital channels (MSO)
- WaveGen
- Measurement applications
  - Mask testing
  - Segmented memory
  - Educators' lab kit

Mask testing

Whether performing pass/fail tests to specified standards in manufacturing or testing for infrequent signal anomalies in R&D debug, the mask test option can be a valuable productivity tool. The 2000 X-Series features the industry's only hardware-based mask testing and can perform up to 50,000 tests per second.

Segmented memory

When capturing low-duty cycle pulses or data bursts, you can use segmented memory acquisition to optimize acquisition memory. Segmented memory acquisition lets you selectively capture and store important segments of signals without capturing unimportant signal idle/dead-time. Segmented memory acquisition is ideal for applications including packetized serial pulses, pulsed laser, radar bursts and high-energy physics experiments. Up to 25 segments can be captured on the 2000 X-Series models with a minimum re-arm time under 19 µs.



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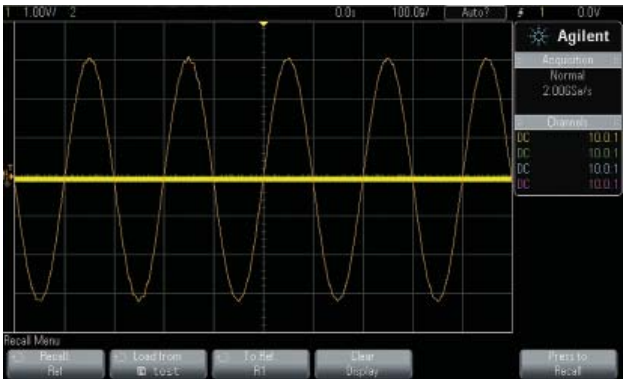
Other productivity tools

Reference waveforms



Store up to two waveforms in the scope's non-volatile reference waveform memory locations. Compare these reference waveforms with live waveforms, and perform post analysis and measurements of stored data. You can also store waveform data on a removable USB memory device that can be recalled back into one of the available two reference memories of the scope for full waveform measurement and analysis. Save and/or transfer waveforms as XY data pairs in a comma-separated values format (*.csv) for PC analysis. Save screen images to a PC for documentation purposes in a variety of formats including: 8-bit bitmaps (*.bmp), 24-bit bitmaps (*.bmp), and PNG 24-bit images (*.png).

Localized GUI and help

Operate the scope in the language most familiar to you. The graphical user interface, built-in help system, front panel overlays, and user's manual are available in 11 languages. Choose from: English, Japanese, simplified Chinese, traditional Chinese, Korean, German, French, Spanish, Russian, Portuguese and Italian. During operation, access the built-in help system just by pressing and holding any button.

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Probe solutions

Get the most out of your 2000 X-Series scope, by using the right probes and accessories for your application. Agilent offers a complete family of innovative probes and accessories for the InfiniiVision 2000 X-Series scopes. For the most up-to-date and complete information about Agilent's probes and accessories, please visit our Web site at www.agilent.com/find/scope_probes.

Other productivity tools

Autoscale

Quickly display any active signals and automatically set the vertical, horizontal and trigger controls for optimal viewing with the press of the autoscale button. (This feature can be disabled or enabled for the education environment).

Connectivity

Built-in USB host (one front, one rear),and USB device ports make PC connectivity easy. A web browser interface allows you to fully operate the scope from your PC and save and recall stored waveforms as well as set-up files via LAN. An optional LAN/VGA module gives you network connectivity if you need it as well as the ability to connect to an external monitor. An optional GPIB module is also available. Only one module may be used at a time.

Keep accessories with the scope

A built-in storage compartment allows you to easily keep your probes, power cords and other accessories with the oscilloscope.

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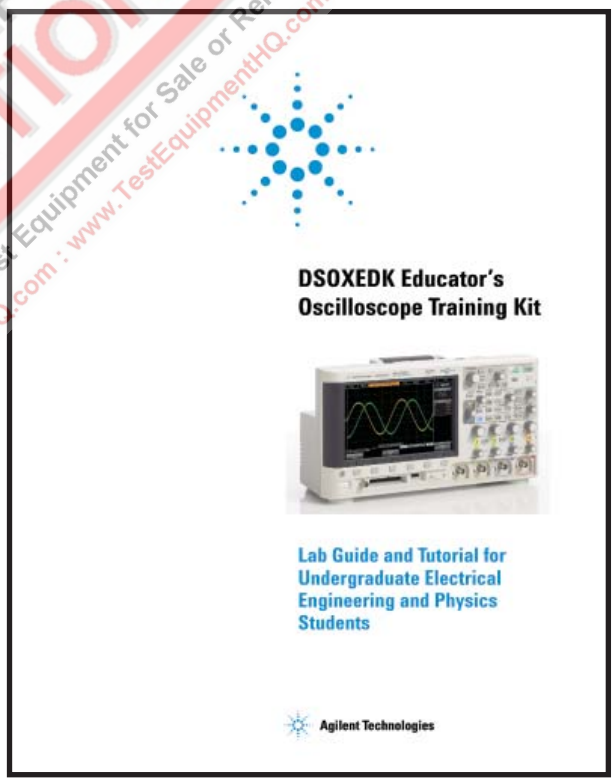
Designed with education in mind

Quickly and easily set up or upgrade a teaching lab

Teach your students what an oscilloscope is and how to perform basic measurements with the Educator's Oscilloscope Training Kit (DSOXEDK). It includes training tools created specifically for electrical engineering and physics undergraduate students and professors. It contains an array of built-in training signals, a comprehensive oscilloscope lab guide and tutorial written specifically for the undergraduate student, and an oscilloscope fundamentals PowerPoint slide set for professors and lab assistants. For more information, refer to www.agilent.com/find/EDK. Also available are DreamCatcher's full semester application-specific courseware written around Agilent test and measurement equipment: www.dreamcatcher.asia/cw.

Get your students to quickly put the scope to work

Intuitive localized front panel design with pushable knobs for quick access to commonly used oscilloscope functions helps students spend more time learning the concepts and less time learning how to use the oscilloscope. Enable your students to answer their own questions with the localized built-in help system that provides quick access by simply pressing and holding any button.



Stretch your budget over the long term

Save money with an industry-exclusive built-in 20 MHz WaveGen, instead of a separate function generator. Buy what you need today and protect your investment in the future with the only oscilloscopes in this class with upgradable bandwidth, 8 digital channels (MSO), WaveGen and measurement applications. Get long scope life and keep repair costs to a minimum with a standard 3-year warranty, and an instrument reliability you've come to expect from the leader in test and measurement equipment.

Optimize lab bench space

With 3 instruments in 1, you will save on precious lab bench space by getting an oscilloscope, logic timing analyzer, and WaveGen function generator all in one innovative instrument with a footprint that is only 5.57 inches deep. With the large 8.5-inch WVGA display, you can easily view all signals on one screen with enough viewing area for more than one student to view.

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Oscilloscopes redefined: Breakthrough technology delivers more scope for the same budget

Designed with research and development in mind

Find more glitches and infrequent events

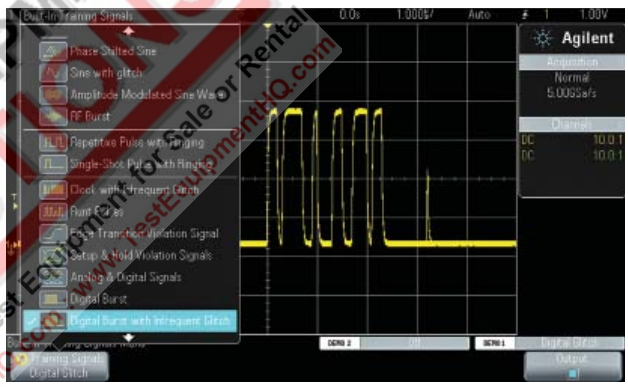
With the fastest architecture in the industry, up to 50,000 waveforms/sec, you can see jitter, infrequent events, and more subtle signal details that other oscilloscopes miss.

Capture and view more of your signals at once

With integrated eight digital timing channels (MSO) models, you can get up to 12 channels of time-correlated triggering, acquisition and viewing on the same instrument with no compromise to the oscilloscopes waveform update rate. Don't need an MSO right now? No problem, just upgrade later when you need it.

Optimize lab bench space

With 3 instruments in 1, you will save money and precious lab bench space by getting an oscilloscope, logic timing analyzer, and WaveGen function generator all in one innovative instrument with a footprint that is only 5.57 inches deep. With the large 8.5-inch WVGA display, you can easily view all signals on one screen with enough viewing area for more than one engineer to view.



Make the most of a limited budget

Project needs change, but traditional oscilloscopes are fixed – you get what you pay for at time of purchase. With the 2000 X-Series, your investment is protected. If you need more bandwidth (up to 200 MHz), 8 digital channels (MSO), WaveGen or measurement applications like mask testing and segmented memory in the future, you can easily add them all when you need to.

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Designed with manufacturing in mind

Stretch a limited budget

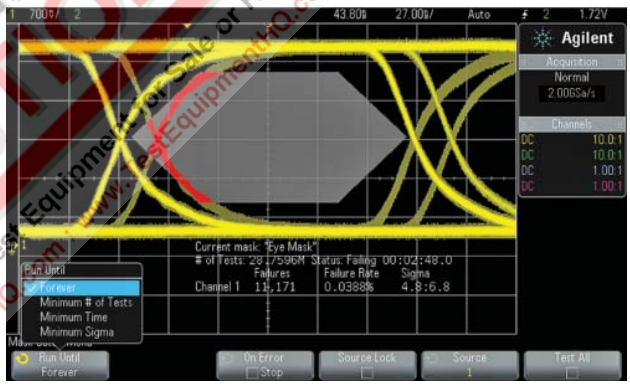
Protect your investment with the 2000 X-Series. If you need more bandwidth (up to 200 MHz) or measurement applications like mask testing in the future, you can easily add them all when you need them.

Get your technicians to quickly put the scope to work

Intuitive localized front panel design and pushable knobs for quick access to commonly used oscilloscope functions allow technicians to spend more time testing and less time learning where the menus are on the oscilloscope. Enable your technicians to answer their own questions with the localized built-in help system that provides quick access by simply pressing and holding any button.

Faster, low-escape test throughput

With the fastest architecture in its class, featuring up to 50,000 waveforms/sec, you will capture more of those elusive problems you worry about and ensure they don't ship to customers. With the mask limit testing measurement application, you can quickly test up to 50,000 signals per second to a known good waveform with quick go/no-go test results, saving you valuable test time while having more certainty.



Optimize test bench space

With 3 instruments in 1, you will save on precious line bench space by getting an oscilloscope, logic timing analyzer, and WaveGen function generator all in one innovative instrument with a footprint that is only 5.57 inches deep. With the large 8.5-inch WVGA display, you can easily view all signals on one screen even when the scope is sitting far away from the operator.

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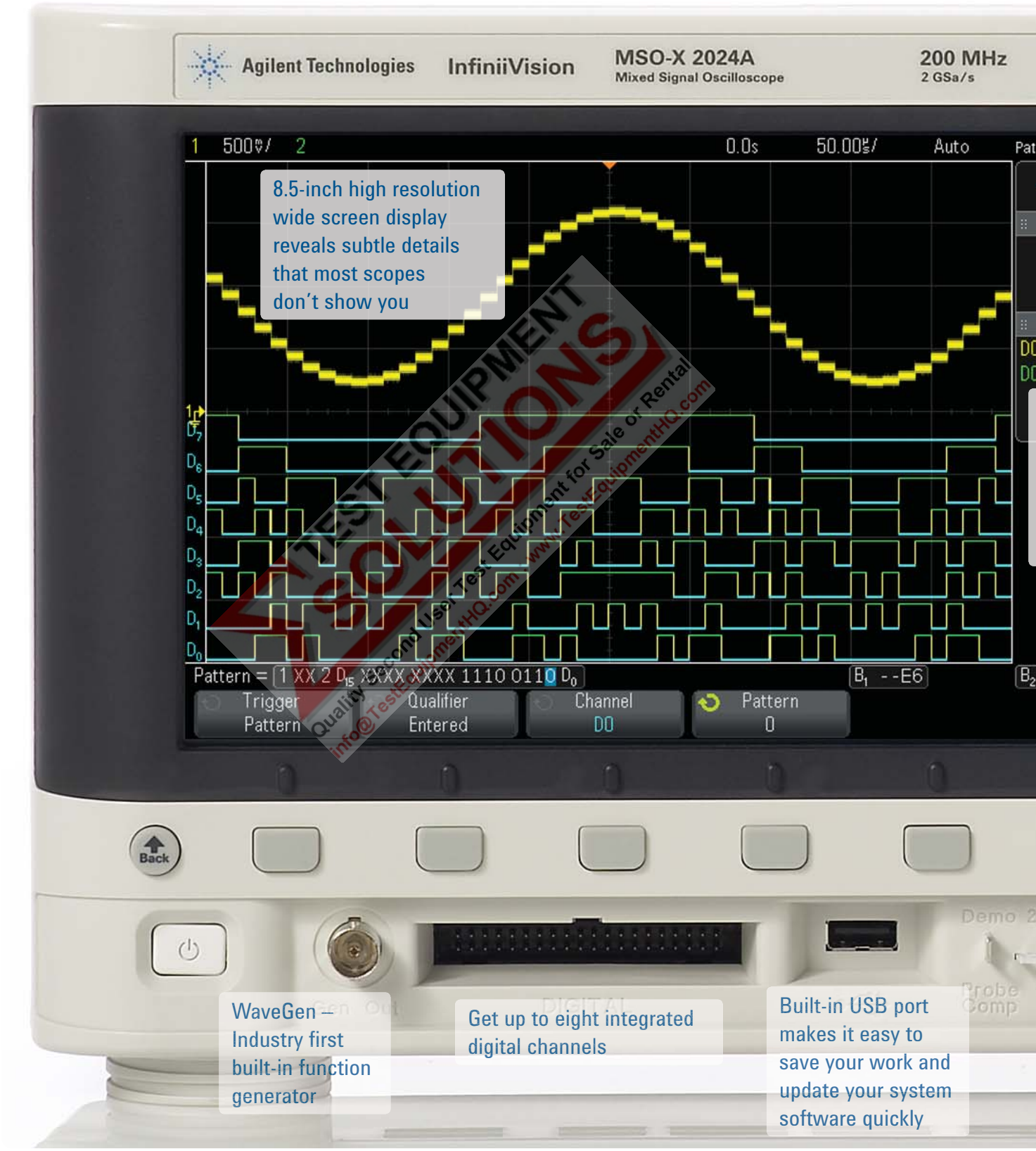
Oscilloscope shown actual size


Agilent Technologies
InfiniiVision
MSO-X 2024A
Mixed Signal Oscilloscope
200 MHz
2 GSa/s
8.5-inch high resolution wide screen display reveals subtle details that most scopes don't show you
Trigger Pattern
Qualifier Entered
Channel D0
Pattern 0
Back
WaveGen – Industry first built-in function generator
Get up to eight integrated digital channels
Built-in USB port makes it easy to save your work and update your system software quickly

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Configuring your InfiniiVision X-Series oscilloscope

Step 1.

Choose your bandwidth and channel count.

InfiniiVision 2000 X-Series scopes	DSOX2002A MSOX2002A	DSOX2004A MSOX2004A	DSOX2012A MSOX2012A	DSOX2014A MSOX2014A	DSOX2022A MSOX2022A	DSOX2024A MSOX2024A
Bandwidth (upgradable)	70 MHz		100 MHz		200 MHz	
Analog channels	2	4	2	4	2	4
Digital channels (MSO)	8 integrated digital channels (optional)					

Step 2.

Tailor your scope with measurement applications to save time and money.

Application	2000 X-Series
WaveGen (built-in function generator)	DSOX2WAVEGEN
Educator's kit	DSOXEDK
Mask testing	DSOX2MASK
Segmented memory	DSOX2SGM

Step 3.

Choose your probes.

Probes	2000 X-Series
N2862B 150 MHz 10:1 passive probe	Standard one per channel for 70 and 100 MHz models
N2863B 300 MHz, 10:1 passive probe	Standard one per channel for 200 MHz models
N6459-60001 8-channel logic probe and accessory kit	Standard on MSO models or with DSOX2MSO upgrade
N2889A 350 MHz 10:1/1:1 passive probe	Optional
10070D 20 MHz 1:1 passive probe with probe ID	Optional
10076A 250 MHz 100:1, 4 kV high-voltage passive probe with probe ID	Optional
N2791A 25 MHz, ±700 V high-voltage differential probe	Optional
N2792A 200 MHz 10:1 differential probe	Optional
1146A 100 kHz, 100 A, AC/DC current probe	Optional

Step 4.

Add the final touches.

Recommended accessories	2000 X-Series
LAN/VGA connection module	DSOXLAN
GPIB connection module	DSOXGPIB
Rack mount kit	N6456A
Soft carrying case and front panel cover	N6457A
Hard copy manual	N6458A

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Performance characteristics

	DSOX2000 Series (digital signal oscilloscope)						MSOX2000 Series (mixed signal oscilloscope)					
Characteristic	2002A	2004A	2012A	2014A	2022A	2024A	2002A	2004A	2012A	2014A	2022A	2024A
Bandwidth* (-3dB)	70 MHz		100 MHz		200 MHz		70 MHz		100 MHz		200 MHz	
Bandwidth upgrade	YES		YES		NO		YES		YES		NO	
Channels	2	4	2	4	2	4	2	4	2	4	2	4
Sample rate on each channel	1 GSa/s per channel, 2 GSa/s interleaved											
Memory depth (record length)	100 kpts											
Display	8.5-inch WVGA with 64 levels of intensity grading											
Waveform update rate	50,000 waveforms/s											
External trigger input	Included on all models											
Vertical resolution	8 bits											
Vertical sensitivity (range)	2 mV/div to 5 V/div**											
DC vertical accuracy	±[DC vertical gain accuracy + DC vertical offset accuracy + 0.25% full scale]**											
DC gain accuracy*	±3% (≥ 10 mV/div); ±4% (< 10 mV/div)**											
DC vertical offset accuracy	±0.1div ±2 mV ±1% of offset setting											
Vertical zoom	Ability to scale and position a live or stopped waveform vertically. When the acquisition is stopped, turning the vertical scale and offset (position) knobs will scale and move the signal. Pan and zoom redraws the waveform in < 100 ms.											
Maximum input voltage	CAT I 300 Vrms, 400 Vpk; transient overvoltage 1.6 kVpkCAT II 300 Vrms, 400 Vpk with 10073C 10:1 probe: CAT I 500 Vpk, CAT II 400 Vpk with N2862A or N2863A 10:1 probe: 300 Vrms											
Position range/offset	2 mV to 200 mV/div: ±2 V >200 mV to 5 V/div: ± 50V											
Bandwidth limit	20 MHz selectable											
Input coupling	AC, DC, GND											
Input impedance	1 MΩ ±2%											
Time base range	5 ns/div to 50 s/div		5 ns/div to 50 s/div		2 ns/div to 50 s/div		5 ns/div to 50 s/div		5 ns/div to 50 s/div		2 ns/div to 50 s/div	
Time base accuracy*	25 ppm ±5 ppm per year (aging)											
Δ Time accuracy (using cursors)	± (timebase acc. x reading) ± (0.0016 x screen width) ± 100 ps											
Dynamic range	(±8 divisions from center screen)											
Horizontal zoom (modes)	Horizontally expand or compress a live or stopped waveform											
Horizontal resolution	2.5 ps											

* Denotes warranted specifications, all others are typical.
Specifications are valid after a 30-minute warm-up period and from ±10 °C firmware calibration temperature.

** 2 mV/div is a magnification of 4 mV/div setting. For vertical accuracy calculations, use full scale of 32 mV for 2 mV/div sensitivity setting.

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Performance characterisitics

Acquisition modes

Normal	
Peak detect	Capture glitch as narrow as 500 ps at all timebase settings.
Averaging	Select from 2,4,8,16, 64... to 65,536
High resolution mode	12 bits of resolution when ≥ 20 µs/div
Segmented	Re-arm time= 19 µs (minimum time between trigger events)

Trigger system

Trigger modes	• Edge (rising/falling alternate, either)–Conventional level-driven trigger. • Pulse width (or glitch)–Trigger on a pulse width less than, greater than, or within a time range, with a selectable time limit ranging from 17 ns to 10 s. • Pattern-trigger on a logical AND combination of the channels. Each channel can have a value of zero, one, don't care (X), or a rising or falling edge (one channel only). • Video–Trigger on all lines or individual lines, odd/even or all fields from composite video or broadcast standards (NTSC, PAL, PAL-M, SECAM).
Trigger coupling	Coupling selections: AC, DC, noise reject, LF reject and HF reject.
Trigger source	Each analog channel, each digital channel (MSO models or DSOX2MSO upgrade, Ext, WaveGen, line)
Trigger sensitivity (internal)*	< 10 mV/div: greater of 1 div or 5 mV; ≥ 10 mV/div: 0.6 div
Trigger sensitivity (external)*	200 mV (DC to 100 MHz); 350 mV (100 MHz - 200 MHz)

Cursors

Types	Amplitude, time , frequency (FFT), manual, tracking, binary, HEX
Measurements	ΔT, 1/ΔT, ΔV/X, 1/ΔX, ΔY

Automatic waveform measurements

Voltage	Snapshot all, maximum, minimum, peak-to-peak, top, base, amplitude, overshoot, preshoot, average- N cycles, average-full screen, DC RMS- N cycles, DC RMS- full screen, AC RMS- N cycles
Time	Period, frequency, rise time, fall time, + width, – width, duty cycle, delay A→B (rising edge), delay A→B (falling edge), phase A→B (rising edge,) and phase A→B (falling edge)
Cursors**	• Single cursor accuracy: +[DC vertical gain accuracy + DC vertical offset accuracy + 0.25% full scale] • Dual cursor accuracy: +[DC vertical gain accuracy + 0.5% full scale]*

* Denotes warranted specifications, all others are typical.
Specifications are valid after a 30-minute warm-up period and from ±10 °C firmware calibration temperature.

** 2 mV/div is a magnification of 4 mV/div setting. For vertical accuracy calculations, use full scale of 32 mV for 2 mV/div sensitivity setting.

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Performance characterisitics

Waveform math

Operators	Add, subtract, multiply, FFT
FFT	Windows: Hanning, flat top, rectangular; Blackman-Harris, up to 64 kpts
Sources	Analog channels 1 and 2, analog channels 3 and 4

Display characteristics

Display	8.5-inch WVGA
Resolution	800 (H) x 480 (V) pixel format (screen area)
Interpolation	Sin(x)/x interpolation (using FIR filter; used when there is less than one sample per column of the display)
Persistence	Off, infinite, variable persistence (100ms-60s)
Intensity gradation	64 intensity levels

MSO (digital channels)

Upgradable from DSO	Yes
MSO channels	8 channels (D0 to D7)
MSO sample rate	1 GSa/s
Threshold selections	TTL (+1.4 V), CMDS (+2.5 V), ECL (-1.3 V), User-definable (±8.0 V in 10 mV stops)
Threshold accuracy	± (100 mV + 3% of threshold settings)
Maximum input dynamic range	±10 V about threshold
Minimum voltage swing	500 mVpp
Input impedance	100 kΩ ± 2% at probe tip, ~8 pF
Minimum detectable pulse width	5ns
Channel-to-channel skew	2 ns (typical), 3 ns (maximum)

Environmental and safety

Temperature	Operating: 0 to +55 °C Non-operating: -40 to +71 °C
Humidity	Operating: Up to 80% RH at or below +40 °C; up to 45% RH up to +50 °C Non-operating: Up to 95% RH up to 40 °C; up to 45% RH up to 50 °C
Altitude	Operating and non-operating: up to 4,000 m
Electromagnetic compatibility	Meets EMC Directive (2004/108/EC), meets or exceeds IEC 61326-1:2005/EN 61326-1:2006 Group 1 Class A requirement CISPR 11/EN 55011 IEC 61000-4-2/EN 61000-4-2 IEC 61000-4-3/EN 61000-4-3 IEC 61000-4-4/EN 61000-4-4 IEC 61000-4-5/EN 61000-4-5 IEC 61000-4-6/EN 61000-4-6 IEC 61000-4-11/EN 61000-4-11 Canada: ICES-001:2004 Australia/New Zealand: AS/NZS
Safety	UL61010-1 2nd edition, CAN/CSA22.2 No. 61010-1-04

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Performance characteristics

WaveGen – built-in function generator	
Waveforms	Sine, square, pulse, triangle, ramp, noise, DC
Sine	• Frequency range: 0.1 Hz to 20 MHz • Amplitude flatness: ±0.5 dB (relative to 1 kHz) • Harmonic distortion: –40 dBc • Spurious (non harmonics): –40 dBc • Total harmonic distortion: 1% • SNR (50 ohm load, 500 MHz BW) : 40 dB (Vpp ≥ 0.1 V); 30 dB (Vpp <0.1 V)
Square wave/pulse	• Frequency range: 0.1 Hz to 10 MHz • Duty cycle: 20 to 80% • Duty cycle resolution: Larger of 1% or 10 ns • Pulse width: 20 ns minimum • Pulse width resolution: 10 ns or 5 digits, whichever is larger • Rise/fall time: 18 ns (10 to 90%) • Overshoot: < 2% • Asymmetry (at 50% DC): ±1% ± 5 ns • Jitter (TIE RMS): 500 ps
Ramp/triangle wave	• Frequency range: 0.1 Hz to 100 kHz • Linearity: 1% • Variable symmetry: 0 to 100% • Symmetry resolution: 1%
Noise	Bandwidth: 20 MHz typical
Frequency	• Sine wave and ramp accuracy: ◦ 130 ppm (frequency < 10 kHz) ◦ 50 ppm (frequency > 10 kHz) • Square wave and pulse accuracy: ◦ [50+frequency/200] ppm (frequency < 25 kHz) ◦ 50 ppm (frequency ≥ 25 kHz) • Resolution: 0.1 Hz or 4 digits, whichever is larger
Amplitude	• Range: ◦ 20 mVpp to 5 Vpp into Hi-Z ◦ 10 mVpp to 2.5 Vpp into 50 ohms • Resolution: 100 µV or 3 digits, whichever is larger • Accuracy: 2% (frequency = 1 kHz)
DC offset	• Range: ◦ ±2.5 V into Hi-Z ◦ ±1.25 V into 50 ohms • Resolution: 100 µV or 3 digits, whichever is larger • Accuracy: ±1.5% of offset setting ±1.5% of amplitude ±1 mV
Trigger output	Trigger output available on Trig out BNC

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InfiniiVision X-Series physical characteristics

Instrument		
Dimensions	mm	Inches
Width	380.6	14.98
Height	204.4	8.05
Depth	141.5	5.57
Weight	kg	lb
Instrument only	3.85	8.5
With accessories	4.08	9.0
Instrument shipping – package dimensions	mm	Inches
Width	450	17.7
Height	250	9.84
Depth	360	14.17
Rack mount	mm	Inches
Width	481.6	18.961
Height	221.5	8.72
Depth	189.34	7.454

Connectivity	
Standard ports	One USB 2.0 high-speed device port on rear panel Two USB 2.0 high-speed host ports, front and rear panel Supports memory devices and printers
Optional ports	GPIB, LAN, VGA

Nonvolatile storage	
Reference waveform display	2 internal waveforms or USB thumb drive
Waveform storage	Set up, .bmp, .png, .csv, ASCII, XY, reference waveforms, .alb, .bin, lister, mask
Max USB flash drive size	Supports industry standard flash drives
Set ups without USB flash drive	10 internal setups
Set ups with USB flash drive	Limited by size of USB drive

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